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Elder abuse and socioeconomic inequalities: A multilevel study in 7 European countries

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ABSTRACT

Objectives: To compare the prevalence of elder abuse using a multilevel approach that takes into account the characteristics of participants as well as socioeconomic indicators at city and country level.

Methods: In 2009, the project on abuse of elderly in Europe (ABUEL) was conducted in seven cities (Stuttgart, Germany; Ancona, Italy; Kaunas, Lithuania, Stockholm, Sweden; Porto, Portugal; Granada, Spain; Athens, Greece) comprising 4467 individuals aged 60–84 years. We used a 3-level hierarchical structure of data: 1) characteristics of participants; 2) mean of tertiary education of each city; and 3) country inequality indicator (Gini coefficient). Multilevel logistic regression was used and proportional changes in Intraclass Correlation Coefficient (ICC) were inspected to assert explained variance between models.

Results: The prevalence of elder abuse showed large variations across sites. Adding tertiary education to the regression model reduced the country level variance for psychological abuse (ICC = 3.4%), with no significant decrease in the explained variance for the other types of abuse. When the Gini coefficient was considered, the highest drop in ICC was observed for financial abuse (from 9.5% to 4.3%).

Conclusion: There is a societal and community level dimension that adds information to individual variability in explaining country differences in elder abuse, highlighting underlying socioeconomic inequalities leading to such behavior.

Introduction

The European Union (EU) countries face a demographic decline characterized by low natural growth and consequent aging of its population (Fésüs et al., 2008). The increasing proportion of people in older age groups is a challenge for health and social services, and contributes to individual and community vulnerability. Such general conditions facilitate the occurrence of different types of abuse, which may add to the burden of diseases characteristic of old age. The deterioration in general health and a greater dependence on others feed a vicious cycle which is difficult to revert. Elder abuse has been recognized as a significant and growing problem in every society (Cooper et al., 2008; Ploeg et al., 2009; World Health Organization, 2002). However, available data on elder abuse reveal a picture of wide variability across countries (Cooper et al., 2008).

The World Health Organization ecological model is the most frequently used theoretical frame to understand violence (Norris et al., 2013; Reilly and Gravdal, 2012; Schiamberg and Gans, 2000; World Health Organization, 2002). It considers that interpersonal violence, including elder abuse, is a complex and multifaceted phenomenon, with determinants that operate at several levels. Beyond individual features and circumstances, country and societal characteristics can help to understand the problem of elder abuse. Macroeconomic indicators and social-educational conditions, commonly used to represent contextual characteristics in cross-country comparisons, may thus contribute to a better understanding of the recognized geographical variation in the prevalence of elder abuse and provide clues to preventive measures.

Part of the observed variation lays in the methodological choices. Different studies opt for different definitions of abuse, different types

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of instruments to measure abuse, and make particular choices related with data collection, with specific modes of administrating questionnaires, interviewers' gender combinations or settings for the interview (Cooper et al., 2008; Mysyuk et al., 2012). The ABUEL study was designed with the general objective of assessing elder abuse in different European countries, using a standardized methodology (Lindert et al., 2012, 2013; Macassa et al., 2013) and, through that common approach, aimed to overcome some of the previously identified caveats.

The present study used a multilevel approach that takes into account both individual participants characteristics and socioeconomic indicators on the country level to compare the prevalence of elder abuse obtained in samples of the urban general population aged 60 to 84 years old and living in seven European countries.

Participants and methods

Study design and procedures

The project on abuse of elderly in Europe (ABUEL) is a cross-sectional community study of individuals from the general population in seven cities in Europe (Stuttgart, Germany; Ancona, Italy; Kaunas, Lithuania, Stockholm, Sweden; Porto, Portugal; Granada; Spain; Athens, Greece). The survey was conducted in January–July 2009, and the methods, sampling strategy and response rates have been described elsewhere (Lindert et al., 2012).

Sampling and administration procedures were performed in accordance with national requirements governing survey/interview studies. Overall, 4467 community dwellers participated in the ABUEL study. Inclusion criteria were: aged 60–84 years; no dementia or other cognitive impairments; naturalization status (citizens and documented migrants eligible); living in own or rented houses; and proficiency of the countries' native languages. Mean response rate was 45.2%.

Written information about the ABUEL study was sent to the homes of eligible individuals. Trained interviewers telephoned the eligible persons (except in Lithuania) providing information about ABUEL. Written informed consent from participants was obtained before the interviews.

Ethical approval was obtained from national or regional ethics review boards.

Each national study adapted the original English version of the questionnaire (http://www.abuel.org/docs/pub02_questionnaire.pdf) with an independent translation and back-translation. Two administration modes were used: (i) face-to-face interviews (Spain, Italy, Greece, Lithuania, Portugal); and mixed methods, i.e. face-to-face interviews and mailed questionnaires (Germany, Sweden). A non-response questionnaire could not be administered, but basic socio-demographic information (e.g. age, sex) was available from the registries.

Individual-level measures

Information from the questionnaire allowed the classification of socioeconomic status of each participant through education (category corresponding to the highest completed level of formal education) and housing (being a house owner or not). Additionally, elder abuse was measured through 52 questions based on the UK study on elder abuse (Melchiorre et al., 2013) and the Revised Conflict Tactics Scale (CTS2) (Straus et al., 1996). Eleven questions covered psychological violence (e.g. insults), 17 questions addressed physical abuse (e.g. beatings) and physical abuse followed by injuries (e.g. bruises, 7 items), eight questions were on sexual abuse (e.g. performing sexual acts against the will) and nine questions on financial abuse (e.g. forcibly taken money). The frequency of abuse in the past year was recorded as never, once, twice, 3–5, 6–11, 11–20 or >20 times but for analysis only two categories ("never" vs. "ever") were considered. Prevalence of elder abuse was presented as total or as one of three separate forms: a) psychological, b) financial and c) physical, sexual and injury. This allowed us to cover different natures of abuse while assuring an appropriate sample size.

City-level and country-level measures

We considered the proportion of tertiary education (university or similar) as collected at the individual completed level to characterize the education level of this population group in each city. Also, four country-level indicators were tested: Gini coefficient, gross domestic product (GDP) per capita, percentage of social benefits directed to the elderly and unemployment rate. They were obtained from Eurostat databases for the year 2009 (http://epp.eurostat.ec.europa.eu) and their definition was extracted from the meta-information of each indicator available online.

The Gini coefficient is an indicator for economic inequality at the country level and represents the distribution of income in a population, varying between 0, which reflects complete equality, and 1, which indicates complete inequality (i.e. 1 person has all the income, all others have none). The nominal GDP per capita, in Euro, is a measure of the total output GDP divided by the number of people in the country. Social benefits consist of transfers, in cash or in kind, by social protection schemes to households and individuals, to relieve them of the burden of a defined set of risks or needs. The functions (or risks) are: sickness/healthcare, disability, old age, survivors, family/children, unemployment, housing, and social exclusion not elsewhere classified. In this study, we only used the percentage of total social benefits directed to old age. The unemployment rate is the number of people unemployed as a percentage of the labor force. The data used consider unemployed someone aged 15 to 74 who is without work during the reference week, is available to start work within the next two weeks, and has actively sought employment at some point in the last four weeks.

Statistical analysis

A correlation matrix was constructed to present the association among and between country-level indicators, as well as the prevalence of different types of elder abuse. Spearman's correlation coefficients were used to estimate the magnitude of these associations.

A multilevel logistic regression was fitted to accommodate the 3-level hierarchical structure of data, with parameters estimated using restricted iterative generalized least square models (Due et al., 2009; Elgar et al., 2009; Holstein et al., 2009). For each type of abuse, sequential models were considered: The first model analyzed the crude between-country variance in elder abuse without considering any individual, study city or country variables; the second model included individual characteristics; the third model added a city-level variable: mean tertiary education; and the fourth model considered the country-level variables. This approach aimed to quantify the size of country and city differences (model 1), and how much of the variation was due to individual characteristics (model 2); models 3 and 4 examined associations between city and country characteristics and the probability of abuse that was independent of individual features.

We measured the association between elder abuse and different exposure variables by means of odds ratios (OR) and their 95% confidence intervals (CI), as obtained from the regression coefficients and its associated standard errors. In models 2, 3 and 4, we studied city and country-individual interactions by letting the regression coefficients of the individual variables be random at the country level (i.e., a random slopes analysis where we relax the assumption of constant effects of individual variables on elder abuse across countries). This analysis allowed us to investigate whether context (city and country) explains the variation in elder abuse prevalence. Such effects were also measured by proportional change in variance from model 1 to model 4; ICCs were also computed to show the percentage of the observed variation in abuse attributable to country-level characteristics.

Statistical analyses were performed with the free software R, version 2.13.0 (R Development Core Team, 2008).

Results

Table 1 shows the country-specific distributions of participants' characteristics: gender, age, education and housing. The highest proportion of people with completed university level was observed in Stockholm (Sweden) (33.3%) and the lowest in Athens (Greece) (9.2%). GDP and Gini coefficients for the participating countries showed large variations. GDP ranged from 8000 Euro per capita in Lithuania to 31,500 Euro per capita in Sweden. In addition, the Gini coefficients varied from 0.248 in Sweden to 0.355 in Lithuania, the sample countries with the lowest and the highest levels of inequality. Among all countries, Spain showed the highest proportion of unemployment and it was also the country with the lowest proportion of social benefits spent with the elderly.

The total prevalence of elder abuse (elders who report being victims of any type of abuse at least once during the past year) showed large variations across countries (Table 2). The lowest prevalence of psychological abuse occurred in Italy (for females, 6.9%; for males, 16.9%) and the highest in Sweden (for females, 24.9%; for males, 35.6%). In Portugal, the prevalence of financial abuse was 7.8%, representing the highest proportion of such abuse among the study countries. Greece presented the highest proportion of combined physical, sexual abuse and injury.

Table 3 shows the correlation between city-level and country-level measures and each type of elder abuse. A strong significant correlation was observed between city mean high-education level and the prevalence of psychological elder abuse ($r = 0.893$, $p < 0.01$). No statistically significant correlation was observed between other country-level socioeconomic measures and any type of elder abuse. However, psychological abuse was more frequent in countries with lower Gini coefficients, whereas the prevalence of financial abuse was higher in countries with higher Gini coefficients.

Results of the multilevel logistic regression analyses for each type of elder abuse are presented in Table 4. The intercept-only model (model 1) revealed a significant amount of variation in abuse prevalence between countries (Table 4). The ICC indicated that 17.7% of the total variance in psychological violence could be accounted by country-level effects. The corresponding figures for financial abuse and the remaining types of abuse were 13.4% and 12.7%, respectively. We observed a decreasing trend in the ICC from model 1 to model 4 for the three types of abuse considered, although of a different magnitude, according to the variables fitted in each model and the type of violence.

In model 2, with the addition of the individual level variables, we observed that significant associations differed depending on the type of abuse: Living in a rented house was significantly associated to elder psychological abuse (OR = 1.29, 95% CI 1.08–1.55), and older age groups were significantly associated to financial abuse (OR = 1.69, 95% CI 1.24–2.31). However, the attenuation in the ICC was very weak (the largest decline was 1.6% for physical and sexual abuse and injury), meaning that country-level characteristics are likely to explain the remaining variance in the prevalence of elder abuse.

By adding the mean of tertiary education (model 3), the country level variance was reduced to 0.034 for psychological elder abuse (ICC decreased from 16.3% to 3.4%), but there was no significant decrease in the explained variance concerning the other types of abuse, and it did not change the magnitude of the associations for all tested individual level variables. When the Gini coefficient was added (model 4), the largest ICC decrease was observed for financial abuse (from 9.5% to 4.3%), while the association with the other considered individual variables kept marginally unchanged.

Discussion

The present study found a significant contribution of community-level socioeconomic indicators to explain the cross country variation in elder abuse among this group of EU developed countries. In particular, the Gini coefficient seems to further explain country differences in the prevalence of financial elder abuse, and the city mean of tertiary education is responsible for a significant amount of variation in the prevalence of psychological abuse of the elderly population.

Results from previous studies provided an inconsistent picture of the impact of socioeconomic features in elder abuse. A study performed in Ireland showed that individuals with a low-income had a doubled risk

Table 1
Characteristics of study population, city and country of residence of participants (60–84 years.) from the 7 countries of ABUEL study, 2009.

	Germany	Greece	Italy	Lithuania	Portugal	Spain	Sweden
	n = 648	n = 643	n = 628	n = 630	n = 656	n = 636	n = 626
Individual-level							
Gender							
Females (%)	52.9	55.4	57.0	64.3	61.0	57.2	53.2
Age (years)							
60–69 (%)	49.5	53.5	45.1	46.7	48.9	45.3	57.7
70–84 (%)	50.5	46.5	54.9	53.3	51.1	54.7	42.3
Education							
Primary or less (%)	3.3	40.2	38.9	30.0	47.8	63.0	33.2
Secondary (%)	65.0	40.7	50.3	46.0	36.1	11.6	33.4
University (%)	31.7	9.2	10.8	23.9	16.0	15.4	33.3
Housing							
Own (%)	62.2	76.0	86.5	98.1	53.5	84.3	72.4
Other (%)	37.8	24.0	13.5	1.9	46.5	15.7	27.6
City-level							
Tertiary[a] education(%)	31.7	9.2	10.8	23.9	16.0	15.4	33.3
Country-level							
GDP per capita (Euro)	29,900	20,500	25,200	8000	15,800	22,800	31,500
Gini coefficient	0.291	0.331	0.315	0.355	0.354	0.323	0.248
Unemployment rate (%)	7.8	9.5	7.8	13.7	10.6	18.0	8.3
Social benefits to old age (%)	17.9	21.2	19.2	15.2	17.0	14.7	15.7

[a] Corresponds to the study sample university level. In the regression models it is assumed as the mean education for every individual at each study city.

Table 2
Prevalence (%) of total elder abuse, psychological abuse, financial abuse and physical and sexual abuse, and injury by gender, according to country of residence for elders from 7 countries: ABUEL study, 2009.

	Germany	Greece	Italy	Lithuania	Portugal	Spain	Sweden
Total abuse	30.4	15.6	12.7	26.2	27.6	14.5	30.8
Females	30.5	18.3	9.3	26.3	29.6	15.9	25.8
Males	30.3	12.5	18.8	25.9	24.4	12.4	36.9
Psychological abuse	27.1	13.2	10.4	24.6	21.9	11.5	29.7
Females	26.8	14.7	6.9	25.1	25.4	12.8	24.9
Males	27.5	11.3	16.9	23.7	16.6	9.7	35.6
Financial abuse	3.7	4.0	2.6	2.8	7.8	4.7	1.8
Females	3.5	4.9	2.1	2.5	6.7	5.5	1.7
Males	3.8	3.2	3.9	3.4	9.5	4.0	2.0
Physical and sexual abuse and injury	4.5	4.8	1.5	4.3	3.1	1.7	4.5
Females	4.7	6.6	1.7	4.9	3.2	1.6	2.9
Males	3.8	2.6	1.2	3.1	3.1	1.7	6.4

of being victims of abuse of any kind (Naughton et al., 2012); additionally, low income was associated with neglect in a study performed in the USA but not when other forms of abuse were considered (Acierno et al., 2010). In a study from the UK, the prevalence of abuse increased for those who had worked in semi-routine and routine occupations, as well as for those who were living in rented accommodation (Melchiorre et al., 2013). In the ABUEL study, it was previously found that living in a rented house or having a blue-collar job increased the risk of being abused (Lindert et al., 2013) and that different types of abuse presented different strengths of association with characteristics of housing or professional status. Taken together, these results from multiple large studies suggest that the individual economic situation has a different impact on different types of elder abuse. While in a UK study it was reported that the prevalence of overall elder abuse did not vary significantly by level of education (Melchiorre et al., 2013), in ABUEL low education was associated with low probability of abuse (Lindert et al., 2013). However, in the ABUEL sample, the influence of education differed according to the type of abuse, i.e., while low education seemed to be a protective factor for psychological abuse, it was also a risk factor for financial elder abuse.

The ecological correlation approach in the present study also showed that the prevalence of psychological violence increased with the mean of tertiary education. The German and the Swedish cities presented both the highest levels of education and prevalence of psychological abuse. It is possible that more educated participants might be more aware and prone to report abuse, especially valuing minor acts, such as those assessed in the psychological abuse domains. On the other hand, because of social desirability, one can speculate that they tended to declare this type of acts and avoided to report the other, more severe, acts of abuse. Our findings seem to go in line with theories relying on the weight of cultural factors once the population educational level influences the disclosure of psychological abuse experiences.

Financial abuse was negatively correlated with city tertiary education, meaning that it was more frequent among less educated elders. This type of abuse was the second most frequent in the elderly, although its determinants had been little explored (Payne and Strasser, 2012). Financial abuse was more frequent in countries with higher inequalities. As expected, we found that country inequalities, as expressed by the Gini coefficient, significantly contributed to explain country variation in the prevalence of financial elder. Elderly from less wealthy countries are at increased risk of being robbed or scammed, and authorities, public health professionals and other stakeholders have to play an increasingly central role in preventing this type of abuse. The magnitude of the findings calls for action, be it information campaigns, direct empowerment of the elderly population or screening procedures (National Research Council, 2003).

The used macroeconomic country indicators had little contribution in explaining the variation in the prevalence of physical, sexual abuse and injury across countries. There are probably other unexplored contextual features influencing these types of acts that should be the subject of further research. We have also collapsed categories of abuse (physical, sexual abuse and injury) and, therefore, we may be losing specificity; or, because these types of abuse were relatively uncommon, it may also indicate lack of power.

We tested multiple macroeconomic measures in the multilevel regression but we only used the mean of tertiary education and Gini coefficient in the final models. With 7 countries, we were limited by the degrees of freedom when draw inferences. However, all macroeconomic indicators were highly correlated and can be considered proxy measures of each other's.

The instrument used in the ABUEL study to assess abuse showed high reliability across countries (Melchiorre et al., 2013). The factor-loading structure showed congruence, therefore indicating a cross-culturally similar interpretation of the scale items.

Nevertheless, we are aware that the notion and severity of abuse may vary between cultural settings and were probably evidenced by some of the variability observed. Additionally, the countries involved in the study show social and economic discrepancies that contribute to variation in elder abuse prevalence. For instance, it is known that European Northern societies present a better social landscape than Southern European societies, and this could be reflected in the prevalence differences across countries.

As advocated by the ecological model for understanding violence (World Health Organization, 2002), there is no single factor to explain abuse. Abuse is a complex phenomenon that has its roots in the interaction of many factors. The ecological model suggests that, besides individual characteristics, the context where these persons live contributes to explain violent experiences. In order to evaluate these contextual effects, we opted for performing a multilevel analysis. Although multilevel analyses raise some methodological issues such as the ecologic fallacy, this complex approach is likely to be a better reflection of reality. This approach confirmed the relevance of country context in individual experiences of abuse, highlighting the very important influence of country socioeconomic inequalities. Thereby, the reduction of these inequalities between countries could not only improve overall population health but also have an important impact in elder abuse. Efforts may be done at the European level to bridge the socioeconomic differences between countries, and also at country level, by providing specific legislation against elder abuse, raising awareness about abuse through campaigns, and by providing services support to the elders.

Limitations

Some limitations and strengths of our study should be pointed out. The used macroeconomic measures might not represent the actual individual participants of the study, since they pertain to the whole-country

Table 3
Spearman correlation coefficients of country-level measures and prevalence of total elder abuse, psychological abuse, financial abuse and physical, sexual and injury: ABUEL study, 2009.

	GDP[a]	Gini coefficient	Tertiary education (%)	Unemployment (%)	Social benefits (%)[b]	Total elder abuse (%)	Psychological abuse (%)	Financial abuse (%)	Physical, sexual and injury (%)
GDP[a]	1								
Gini coefficient	−0.964**	1							
Tertiary education (%)	0.393	−0.429	1						
Unemployment (%)	−0.667	0.631	−0.144	1					
Social benefits (%)[b]	0.857*	−0.786*	0.214	−0.847*	1				
Total elder abuse (%)	0.321	−0.286	0.857*	−0.198	0.286	1			
Psychological abuse (%)	0.286	−0.321	0.893**	−0.162	0.214	0.964**	1		
Financial abuse (%)	−0.536	0.607	−0.393	0.541	−0.607	−0.179	−0.321	1	
Physical, sexual and injury (%)	0.126	−0.162	0.234	−0.173	0.180	0.595	0.631	−0.090	1

[a] Nominal gross domestic product per capita in Euro per inhabitant.
[b] Percentage of total social benefits to old age.
* $p < 0.05$.
** $p < 0.01$.

populations. However, this is the only way to analyze the impact of societal characteristics on elder abuse prevalence and is certainly important evidence that should be further explored using different methodological strategies. Although the macroeconomic environment seemed to explain some of the country prevalence differences in exposure to elder abuse, there are still other factors at country level that could be considered; for instance, the type of governance structure, the religiosity involvement, the legislation against violence, the availability of support services for elders and supportive institutions for violence situations. Furthermore, we used the proportion of participants

Table 4
Multilevel Logistic Regression Analyses (odds ratios (95% confidence intervals) and variance) for country variance of exposure to elder psychological abuse, financial abuse and physical, sexual abuse and injury from 7 countries: the ABUEL study, 2009.

	Model 1	Model 2	Model 3	Model 4
Psychological abuse				
Fixed effects				
Individual level				
Gender (*ref*: *females*)		1.05 (0.90–1.22)	1.05 (0.90–1.22)	1.05 (0.90–1.22)
Age (*ref*: *60–69*)		0.87 (0.74–1.01)	0.87 (0.74–1.01)	0.86 (0.74–1.00)
Education (*ref*: *univ*)		0.93 (0.77–1.11)	0.93 (0.78–1.13)	0.94 (0.78–1.13)
Housing (*ref*: *own*)		1.29 (1.08–1.55)	1.30 (1.08–1.56)	1.31 (1.09–1.57)
City level				
Tertiary education (%)			1.04 (1.02–1.07)	1.06 (1.03–1.08)
Country level				
Gini coefficient				1.05 (0.98–1.12)
Random effects				
Variance	0.213	0.193	0.034	0.017
Intraclass Correlation Coefficient (ICC)	17.7%	16.3%	3.4%	1.7%
Financial abuse				
Fixed effects				
Individual level				
Gender (*ref*: *females*)		1.19 (0.88–1.62)	1.20 (0.89–1.62)	1.21 (0.89–1.64)
Age (*ref*: *60–69*)		1.69 (1.24–2.31)	1.69 (1.24–2.32)	1.68 (1.22–2.31)
Education (*ref*: *univ*)		0.77 (0.52–1.13)	0.74 (0.51–1.10)	0.74 (0.53–1.09)
Housing (*ref*: *own*)		1.39 (0.98–1.99)	1.44 (1.01–2.05)	1.50 (1.06–2.14)
City level				
Tertiary education (%)			0.97 (0.93–1.02)	0.99 (0.95–1.04)
Country level				
Gini coefficient				1.10 (0.97–1.24)
Random effects				
Variance	0.151	0.149	0.103	0.045
Intraclass Correlation Coefficient (ICC)	13.4%	13.3%	9.5%	4.3%
Physical and sexual abuse, and injury				
Fixed effects				
Individual level				
Gender (*ref*: *females*)		0.86 (0.62–1.20)	0.86 (0.62–1.20)	0.86 (0.62–1.20)
Age (*ref*: *60–69*)		1.01 (0.73–1.40)	1.01 (0.73–1.40)	1.01 (0.73–1.40)
Education (*ref*: *univ*)		0.90 (0.60–1.34)	0.93 (0.62–1.38)	0.93 (0.62–1.39)
Housing (*ref*:*own*)		1.39 (0.96–2.02)	1.38 (0.95–2.00)	1.38 (0.95–2.01)
City level				
Tertiary education (%)				1.02 (0.96–1.08)
Country level				
Gini coefficient				1.01 (0.88–1.18)
Random effects				
Variance	0.139	0.121	0.093	0.091
Intraclass Correlation Coefficient (ICC)	12.7%	11.1%	8.8%	8.7%

with tertiary education in each city as a measure of regional socioeconomic indicator, as opposed to the country educational level, since it is based on the educational level of the active population. A sensitivity analysis was performed using the country-level education and results were similar, although statistical significance was not reached (data not shown).

Conclusions

The present study allowed confirming the relevant contribution of the macroeconomic environment in elder abuse prevalence. There is a community-level dimension (city, country) which adds information to individual variability in explaining country differences in elder abuse, particularly in prevalence of psychological and financial abuse. Although other types of studied elder abuse did not present a clear association with country-level socioeconomic indicators, these findings might be of great relevance for public health preventive efforts. The underlying socioeconomic inequalities in elder abuse appeal to efforts at European and country levels, being expectable that a reduction in these inequalities impacts not only the overall population health but also elder abuse issues.

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Conflict of interest statement

The authors declare there is no conflict of interest.

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